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Effects of Poultry Manure, Household Waste Compost and Inorganic Fertilizer on the Growth, Yield and Quality of Maize (Zea Mays L.)

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In the present work effects of poultry manure, household waste compost and inorganic fertilizers individually and their different combinations on growth and yield of maize were determined from a field experiment. The results indicated that the experimental soil was very poorly fertile, and profitable crop growing without fertilizer application is not feasible there. All the fertilizer treatments improved growth as shown by the number of leaves, length of root and shoot, dry weights of root and shoot. Better growth under fertilizer treatments resulted in higher yield of the crop. But there were significant differences among the fertilizer treatments. For example, the highest yield (6.65 t ha^{-1}) was obtained in the treatment with poultry manure alone and with 25% NPK + 75% poultry manure. These two treatments increased yield of maize by 579 percent over the control (no fertilizer). NPK alone (120 kg N, 60 kg P and 80 kg K) also increased yield but by 309 %. The treatment 50% NPK + 50% poultry manure increased yield by 499 %. Reducing sugar, non-reducing sugar and total soluble sugar contents in grains varied within the ranges of 4.00-5.33%, 19.00-23.33%, and 23.00-28.67%, respectively. There was little difference in sugar contents among the treatments, although a relatively higher sugar was obtained with compost alone treatment. Crude protein in grains varied from 4.77 to 10.08%. The control and T6 (75% NPK + 25% Compost) had given the minimum value and T4 (25% NPK+75% Compost) gave the highest value.

Biography

M. G. Kibria obtained his B. Sc (Honours) and M. Sc degree in Soil Science from University of Dhaka, Bangladesh. He has completed his Ph. D from University of Chittagong. He has published 23 papers in reputed journals. He is an Associate Professor and the Chairman of the Department of Soil Science, University of Chittagong, Bangladesh. He is a member of Indian Society of Soil Science, Bangladesh Soil Science Society, and Asiatic Society of Bangladesh.

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Chemical profiling of Eupatorium adenophorum as a source of potential antifungal and antinemic agent

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Eupatorium adenophorum Spreng (syn. Ageratina adenophora King and Robinson) is fast growing perennial herbaceous plant, belonging to the family Compositae. Essential oil of E. adenophorum leaves was obtained by hydrodistillation and analyzed by gas chromatography–mass spectrometry (GC–MS). Twenty six constituents comprised of sesquiterpenes and monoterpenes were identified in the essential oil. Antinemic activity of essential oil was in the range of LC_{50} 133.7-189.2 μgmL^{-1}. Essential oil was evaluated for antifungal and antinemic activities against plant pathogenic fungi and nematodes. Antifungal activity of essential oil, evaluated by poisoned food technique, resulted maximum activity against Rhizoctoni solani (ED_{50} 51.58 μgmL^{-1}) and Rhizoctonia bataticola (ED_{50} 72.80 μgmL^{-1}), respectively. Chemical investigation on the leaves of E. adenophorum has afforded five cadinene sesquiterpenes, Cadinan-3-ene-2,7-dione (1), 7-Hydroxycadinan-3-ene-2-one (2), 5,6-dihydroxycadinan-3-ene-2,7-dione (3), Cadinan-3,6-diene-2,7-dione (4) and 2-Acetyl-cadinan-3,6-diene-7-one (5). Their structures were elucidated by detailed spectroscopic analyses on the basis of NMR and ESI-MS/MS data. Antifungal activity of cadinene sesquiterpenes against pathogenic fungi was found to be selective. Compound 1 was highly inhibitory against S. rolfsii (ED_{50} 81.60±0.58 μgmL^{-1}) and R. solani (ED_{50} 89.74±1.03 μgmL^{-1}), whereas compound 5 was also active against F. oxysporum (ED_{50} 85.71±0.74 μgmL^{-1}). Chemical constituents were also evaluated for antinemic activity against Meloidogyne incognita. Methanolic concentrate exhibited maximum antinemic activity (LC_{50} 93.7 μgmL^{-1}) followed by petroleum ether concentrate (LC_{50} 99.8 μgmL^{-1}). Among pure compounds, cadinan-3-ene-2,7-dione exhibited significant activity (LC_{50} 151.8 μgmL^{-1}) followed by 7-hydroxycadinene-2-one (LC_{50} 193.1 μgmL^{-1}).

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